

Signature of Invigilators

Roll No.
(In figures as in Admit Card)

1.

LIFE SCIENCES

2.

Paper II

Roll No.

(In words)

D/03/4

Name of the Areas/Section (if any)

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of *fifty (50)* multiple choice type questions. *All* questions are compulsory.
3. Each item has upto four alternative responses marked (A), (B), (C) and (D). The answer should be a capital letter for the selected option. The answer letter should entirely be contained within the corresponding square.

Correct method Wrong Method or

4. Your responses to the items for this paper are to be indicated on the ICR Answer Sheet under paper II only
5. Read instructions given inside carefully.
6. One sheet is attached at the end of the booklet for rough work.
7. You should return the test booklet to the invigilator at the end of paper and should not carry any paper with you outside the examination hall.

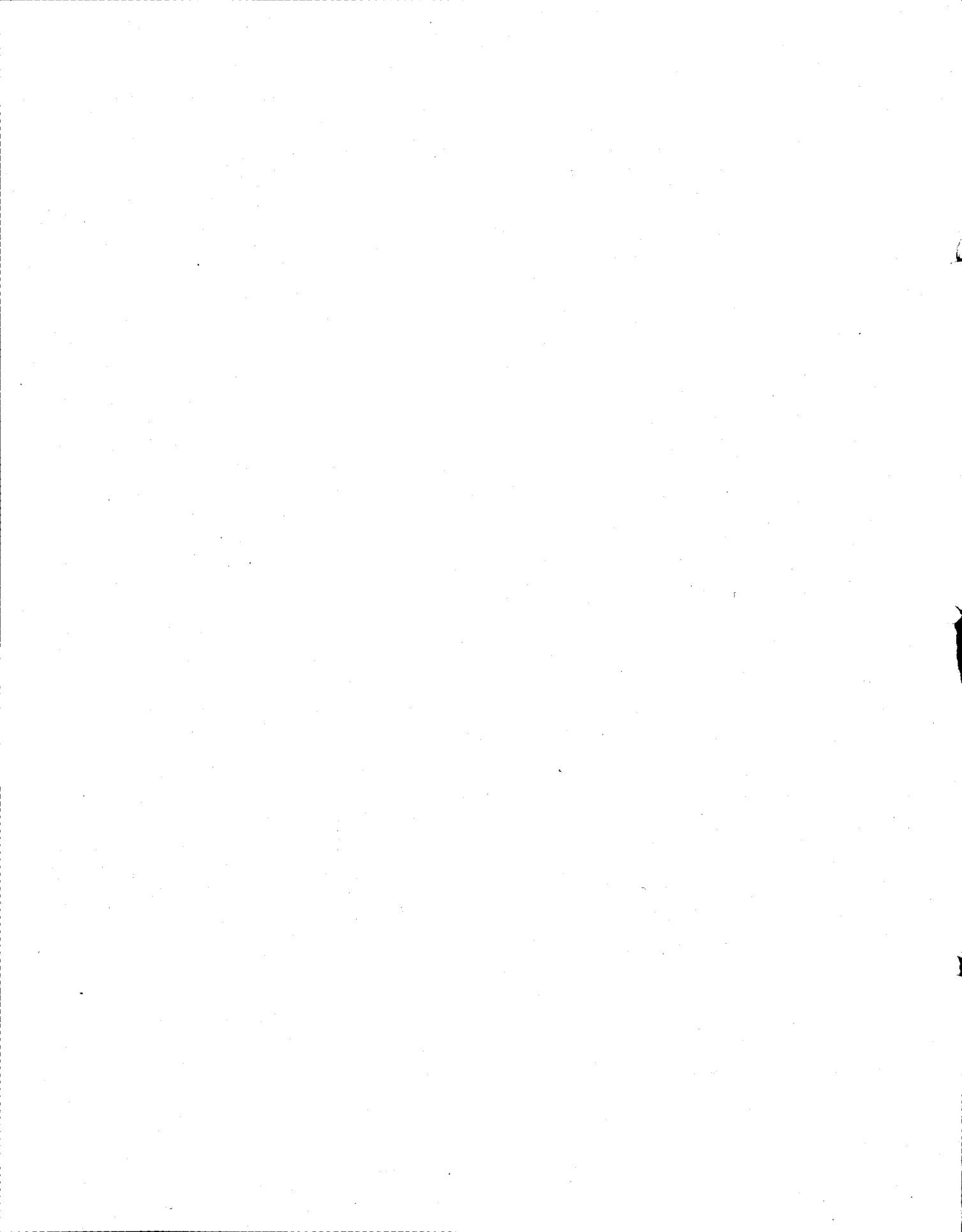
પરીક્ષાર્થીઓ માટેની સૂચનાઓ :

૧. આ પાનાની ટોચમાં દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.
૨. આ પ્રશ્નપત્રમાં કુલ **પચાસ (50)** બહુવૈકલ્પિક ઉત્તરો ધરાવતા પ્રશ્નો આપેલા છે. **બધા જ** પ્રશ્નો ફરજિયાત છે.
૩. પ્રત્યેક પ્રશ્ન વધુમાં વધુ ચાર બહુવૈકલ્પિક ઉત્તરો ધરાવે છે. જે (A), (B), (C) અને (D) વડે દર્શાવવામાં આવ્યા છે. પ્રશ્નનો ઉત્તર કેપીટલ સંજ્ઞા વડે આપવાનો રહેશે. ઉત્તરની સંજ્ઞા આપેલ ખાનામાં બરાબર સમાઈ જાય તે રીતે લખવાની રહેશે.

ખરી રીત : ખોટી રીત : ,

૪. આ પ્રશ્નપત્રના જવાબ આપેલ ICR Answer Sheetના Paper II વિભાગની નીચે આપેલ ખાનાઓમાં આપવાના રહેશે.
૫. અંદર આપેલ સૂચનાઓ કાળજીપૂર્વક વાંચો.
૬. આ બુકલેટની પાછળ આપેલું પાનું રફ કામ માટે છે.
૭. પરીક્ષાસમય પૂરો થઈ ગયા પછી આ બુકલેટ જે તે નિરીક્ષકને સોંપી દેવી. કોઈ પણ કાગળ પરીક્ષાખંડની બહાર લઈ જવો નહીં.

SEAL



LIFE SCIENCES

PAPER II

Note :— This paper contains *fifty (50)* multiple-choice questions, each carrying **two (2)** marks. Attempt *all* the questions.

1. Colchicine interferes with cell division due to :
 - (A) Non-formation of spindle
 - (B) Double replication of chromosomes without formation of nuclei
 - (C) Non-pairing of chromosomes
 - (D) Splitting of chromosomes
2. The major site of cell membrane synthesis is the :
 - (A) Nucleus
 - (B) Plasma membrane
 - (C) Lysosomes
 - (D) Endoplasmic reticulum
3. Lampbrush chromosomes are seen in which typical stage ?
 - (A) Mitotic phase
 - (B) Mitotic metaphase
 - (C) Meiotic metaphase
 - (D) Anaphase
4. When an animal responds to a new antigen, the first antibody produced is :
 - (A) IgG
 - (B) IgD
 - (C) IgM
 - (D) IgE
5. Spot desmosomes :
 - (A) Associate with actin filaments on the cytoplasmic side
 - (B) Are found between cells in epithelium
 - (C) Contain integrins
 - (D) Inhibit transfer of membrane proteins from the basolateral to the apical domain

6. Mutation, in which of the following gene, is most commonly associated with neoplastic transfer ?
- (A) P₅₃ (B) P₃₅
 (C) R_{as} (D) R_{os}
7. In which of the following types of prokaryotes have split genes been found ?
- (A) Eubacteria (B) Cyanobacteria
 (C) Archaeobacteria (D) None of these
8. Which one is the strongest intermolecular force ?
- (A) Hydrogen Bond (B) Dipole-dipole
 (C) van der Waals' forces (D) All are equal
9. The free energy change ΔG :
- (A) is directly proportional to the standard free energy change ΔG°
 (B) is equal to zero at equilibrium
 (C) can only be calculated when reactants and products are at 1 mol/L
 (D) is equal to $-RT \ln K_{eq}$
10. Which one is *not* true of Chargaff's rules ?
- (A) A = T & G = C (B) A + T = G + C
 (C) A + G = T + C (D) A + C = T + G
11. Coding of an amino acid by more than one codon is known as :
- (A) Universality of genetic code
 (B) Degeneracy of the genetic code
 (C) Wobble hypothesis
 (D) Collinearity of gene and protein

12. The strand of DNA for a particular gene that is copied by the RNA polymerase to form mRNA is called :
- (A) Leading (B) Template
(C) Copy (D) Transcription
13. The net ATP produced when palmitate molecule is completely oxidized by β -oxidation will be :
- (A) 36 (B) 131
(C) 129 (D) 130
14. In allosteric regulation, effector molecule usually binds :
- (A) reversibly and covalently
(B) irreversibly and covalently
(C) irreversibly and non-covalently
(D) reversibly and non-covalently
15. Which process occurs in liver ?
- (A) Digestion of proteins (B) Formation of glycogen from glucose
(C) Synthesis of insulin (D) Emulsification of fats
16. Adrenocorticotrophic hormone is secreted by :
- (A) Corticotrophs (B) Gonadotrophs
(C) Thyrotrophs (D) Somatotrophs
17. Active transport requires :
- (A) Carbon dioxide (B) Adenosine triphosphate
(C) Xanthine oxidase (D) Cytochrome oxidase
18. Nourishment to the developing sperm is provided by :
- (A) Seminiferous tubule (B) Interstitial cells
(C) Sertoli cells (D) Germinal epithelium

19. Which of the following physiological responses is caused at high altitude ?
(A) Salivation (B) Polyurea
(C) Erythropoiesis (D) Anemia
20. Which of the following vitamins is an antioxidant ?
(A) Vitamin D (B) Vitamin E
(C) Vitamin B₆ (D) Vitamin K
21. Which of the following statements about stress is *false* ?
(A) Stress does not disrupt homeostasis
(B) Stress leads to adaptive changes
(C) Long-term stress may lead to disease
(D) Homeostatic mechanisms counteract stress
22. The experimental system Mendel studied was :
(A) *Drosophila melanogaster* (B) *Pisum sativum*
(C) *Zea mays* (D) *Mus muscalus*
23. The proteins that bind to the TATA box in the promoter region are known as :
(A) Coregulators (B) Enhancers
(C) Coactivators (D) Transcriptional factors
24. Segregation of alleles takes place during the following phase of meiotic division ?
(A) Leptotene (B) Zygotene
(C) Diakinesis (D) Anaphase II
25. Ionizing radiation damages DNA by :
(A) Cross-linking the DNA
(B) Generating free radicals that subsequently strike the DNA
(C) Causing dimerization of pyrimidines
(D) Causing dimerization of purines

26. RNA polymerase forms an open transcription complex when it is bound to :
- (A) Soluble transcription factors
 - (B) Promoter
 - (C) Upstream regulatory sequences
 - (D) Internucleosomal regions
27. During the initiation phase of translation in bacteria, which of the following is first to dissociate from 30S ribosomal subunit ?
- (A) IF₂
 - (B) IF₃
 - (C) GTP
 - (D) tRNA
28. Which of the following defines mutation ?
- (A) A change in morphology of the organism
 - (B) A change in the state of health of an organism
 - (C) A change in nucleic acid sequence of the organism subsequently inherited by the progeny
 - (D) A change in the protein profile of an organism
29. In primordial earth :
- (A) there was no CO₂
 - (B) there was no O₂
 - (C) there was no nitrogen
 - (D) there was no ammonia
30. Which of the following micro-organisms can be used for mediating gene transfer to plants ?
- (A) *Escherichia coli*
 - (B) *Agrobacterium tumefaciens*
 - (C) *Saccharomyces cerevisiae*
 - (D) *Bacillus thuringiensis*
31. Jean Baptiste de Lamarck :
- (A) Undertook the voyage in H.M.S. Beagle
 - (B) Authored the first complete explanation of evolution in 1809
 - (C) Wrote the book "The Descent of Man and Selection in Relation to Sex"
 - (D) Was a well-known Geologists who studied fossils

32. Genetic equilibrium is disturbed in natural populations by :
- (A) Increasing the frequency of dominant allele in a population
 - (B) Endemism
 - (C) Heterozygous condition
 - (D) Random genetic drift
33. The ultimate source of all new variations on which selection acts is :
- (A) Polyploidy
 - (B) Paedomorphosis
 - (C) Mutation
 - (D) Adaptive radiation
34. Which set of the following factors contributed to Darwin's evolutionary theory ?
- (A) Inheritance of acquired characters, barriers, isolation
 - (B) Fossils, geographic distribution, homology
 - (C) Ontogeny, phylogeny, speciation
 - (D) Mutation, polymorphism, adaptation
35. In the evolution of species, the most important factor is :
- (A) Geographic isolation
 - (B) Barriers
 - (C) Hybridization
 - (D) Reproductive isolation
36. The most familiar fungi, the mushrooms, belong to the group :
- (A) Ascomycetes
 - (B) Basidiomycetes
 - (C) Deuteromycetes
 - (D) Zygomycetes
37. A geographical region characterized by a distinct landscape, climate and community of organisms is called :
- (A) Population
 - (B) Ecology
 - (C) Ecosystem
 - (D) Biome

38. The study of freshwater lakes, ponds, rivers and streams is known as :
- (A) Limnology (B) Oceanography
(C) Aquology (D) Hydrology
39. For its action as a herbicide, glyphosate blocks :
- (A) Synthesis of aromatic aminoacid
(B) Transfer of electrons in photosystem II
(C) Transfer of electrons from photosystem I
(D) Transport of water from roots
40. The largest reserves of carbon are in the :
- (A) Water (B) Fossil fuels
(C) Plants (D) Air
41. The science of naming and grouping of organisms is known as :
- (A) Classification system (B) Taxonomy
(C) Paleontology (D) Nagnronomy
42. The lotic habitats of inland waters is characterized by :
- (A) High levels of dissolved oxygen
(B) Low levels of dissolved oxygen
(C) No dissolved oxygen
(D) Very low levels of dissolved oxygen
43. A cladistic taxonomists describe grouping of organisms based on :
- (A) Phylogeny (B) Polygeny
(C) Monogeny (D) Ecogeny
44. The flower parts of a monocot plant are in multiples of :
- (A) Two (B) Three
(C) Four (D) Five

45. In test cross, the F_1 heterozygotes are crossed :
- (A) with unknown parent
 - (B) with homozygous parent
 - (C) for self-pollination
 - (D) with homozygous recessive parent
46. Which one of the following species is endemic to Indian subcontinent ?
- (A) Tapir
 - (B) Elephant
 - (C) Wild Ass
 - (D) Giant Panda
47. In tropical forests, the main cause of biodiversity loss is :
- (A) Fragmentation
 - (B) Pests
 - (C) Pollution
 - (D) Overexploitation
48. Which one of the following methods of conservation was successful in increasing crocodile population in India ?
- (A) Captive breeding
 - (B) Banning use of crocodile leather
 - (C) Creating sanctuaries
 - (D) Relocating them to protected areas
49. Which one of the following is considered as World Heritage Site in India ?
- (A) Gir National Park
 - (B) Bharatpur Bird Sanctuary
 - (C) Rathambhore Tiger Reserve
 - (D) Nalsarovar Bird Sanctuary
50. Which one of the following belongs to Acoelomate phyla ?
- (A) Nematomorpha
 - (B) Platyhelminthes
 - (C) Phoronida
 - (D) Echinodermata

ROUGH WORK

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